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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,244	08/30/2001	Fabrizio Di Pasquale	CISCP711	1793

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EXAMINER

KIM, RICHARD H

ART UNIT PAPER NUMBER

2882

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/944,244

Applicant(s)

PASQUALE ET AL.

Examiner

Richard H Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-15, 17-23, 25 and 26 is/are rejected.
- 7) ☒ Claim(s) 8, 16 and 24 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 9-12, 17-20 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (US 6,433,921 B1) in view of Sun et al. (US 6,417,961 B1) and Danziger (US 6,339,665 B1).

Referring to claim 1, Wu et al. discloses a WDM communications system comprising a first dispersion compensating fiber traversed by the WDM signal (see Fig. 3, ref. 40; col. 7, lines 40-46; col. 5, lines 36-37), the first dispersion compensating fiber pumped with pump energy to induce Raman amplification of the WDM signal (see col. 7, lines 46-56; Fig. 3, ref. 20, 22); and a second dispersion compensating fiber in cascade with the first dispersion compensating fiber (see Fig. 3, ref. 42, col. 7, lines 40-46); wherein the first dispersion compensating fiber has a fixed length (see Fig. 3, ref. 40). However the reference does not disclose that the second dispersion compensating fiber has a variable length.

Sun et al. discloses a first dispersion compensating fiber with a fixed length (see col. 3, lines 45-48); and a second dispersion compensating fiber with variable amount of dispersion compensation (see col. 3, lines 49-66). Danziger discloses varying the amount of dispersion compensation in a fiber by varying the length of the fiber (see col. 7, lines 48-52).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the second dispersion compensating fiber variable in length in order to vary the amount of dispersion compensation to what is desired according to the length of the transmission fiber (see col. 3, lines 59-60). Such a modification would improve the overall versatility of the device. Moreover, it has been held that the provision of adjustability, where needed, involves only routine skill in the art. *In re Stevens*, 101 USPQ (CCPA 1954).

Referring to claim 2, Wu et al. discloses an apparatus comprising a gain-flattening filter connected between the first dispersion compensating fiber and the second dispersion compensating fiber (see Fig. 3, ref. 38; col. 6, line 45).

Referring to claim 3, Wu et al. discloses an apparatus comprising an attenuator connected between the first dispersion compensating fiber and the second dispersion compensating fiber (see Fig. 3, ref. 38; col. 6, line 46).

Referring to claim 4, Wu et al. discloses an apparatus comprising a power control loop that performs power measurements on output of the second dispersion compensating fiber and adjusts a power level of pump energy to at least one of the first dispersion compensating fiber and second compensating dispersion fiber (see Fig. 4, col. 7, lines 64-67, col. 8, lines 1-34).

Referring to claims 9 and 17, Wu et al. discloses a method comprising and means for passing an optical signal through a first dispersion compensating fiber and then through a second dispersion compensating fiber (see Fig. 3, ref. 40; col. 7, lines 40-46; col. 5, lines 36-37); pumping the first dispersion compensating fiber with pump energy to induce Raman amplification of the optical signal therein (see col. 7, lines 46-56; Fig. 3, ref. 20, 22); and pumping the second dispersion compensating fiber with pump energy to induce Raman

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amplification of the optical signal therein (see Fig. 3, ref. 20, 22; col. 7, lines 40-46); and wherein the first dispersion compensating fiber has a fixed length (see Fig. 3, ref. 40). However the reference does not disclose that the second dispersion compensating fiber has a variable length.

Sun et al. discloses a first dispersion compensating fiber with a fixed length (see col. 3, lines 45-48); and a second dispersion compensating fiber with variable amount of dispersion compensation (see col. 3, lines 49-66). Danziger discloses varying the amount of dispersion compensation in a fiber by varying the length of the fiber (see col. 7, lines 48-52).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the second dispersion compensating fiber variable in length in order to vary the amount of dispersion compensation to what is desired according to the length of the transmission fiber (see col. 3, lines 59-60). Such a modification would improve the overall versatility of the device. Moreover, it has been held that the provision of adjustability, where needed, involves only routine skill in the art. *In re Stevens*, 101 USPQ (CCPA 1954).

Referring to claims 10 and 18, Wu et al. discloses a method comprising and apparatus comprising means for filtering the optical signal between the first dispersion compensating fiber and the second dispersion compensating fiber for equalization of spectral content of the optical signal (see Fig. 3, ref. 38; col. 6, line 45).

Referring to claims 11 and 19, Wu et al. discloses a method and apparatus comprising means for attenuating the optical signal between the first dispersion compensating fiber and the second dispersion compensating fiber (see Fig. 3, ref. 38; col. 6, line 46).

Referring to claims 12 and 20, Wu et al. discloses a method and apparatus comprising means for performing power measurements on output of the second dispersion compensating fiber; and adjusting the a power level of pump energy directed to at least one of the first dispersion compensating fiber and the second dispersion compensating fiber in response to the fiber measurements (see Fig. 4, col. 7, lines 64-67, col. 8, lines 1-34).

Referring to claim 25, Wu et al. discloses a device wherein the second dispersion compensating fiber is pumped with pump energy to induce Raman amplification of the WDM signal (see Fig. 3, ref. 20, 22; col. 7, lines 40-46).

Referring to claim 26, Wu et al., Sun et al. and Danziger disclose the device previously recited. However, Wu et al. does not explicitly state that the WDM signal traverses the first dispersion compensating fiber prior to the second dispersion compensating fiber.

Sun et al. discloses a device wherein the WDM signal traverses the first dispersion compensating fiber prior to the second dispersion compensating fiber (see col. 3, lines 49-67).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the first dispersion compensating fiber prior to the second dispersion compensating fiber in order to vary the amount of dispersion compensation from the first fiber to what is desired according to the length of the transmission fiber by varying the amount of compensation of the second fiber (see col. 3, lines 59-60). Such a modification would improve the overall versatility of the device.

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3. Claims 5-7, 13-15 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al., Sun et al. and Danziger, in view of Bolshtyansky et al. (US 6,417,959 B1).

Referring to claims 5, 13 and 21, Wu et al., Sun et al. and Danziger discloses the device, method and means previously recited. Wu et al. further discloses the device, method and means comprising a first laser pump providing pump energy (see col. 7, lines 46-48). However, the reference does not disclose the laser pump providing pump energy on a first wavelength to the first dispersion compensating fiber and the second dispersion compensating fiber.

Bolshtyansky et al. discloses a laser pump providing energy on a first wavelength (see Fig. 4, ref. 28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a laser pump on a first wavelength to the first dispersion compensating fiber and the second dispersion compensating fiber in order to amplify and optical signal over a predetermined wavelength, thereby allowing the device to be specified to the wavelength traversing the fiber. Further, having a single laser pump providing pump energy to the first and second fiber dispersion compensating fiber provides amplification to the signal, via two couplers, and therefore would be a functionally equivalent modification to the invention disclosed in Wu et al.

Referring to claims 6, 14 and 22, Wu et al., Sun et al., Danziger and Bolshtyansky et al. disclose the apparatus, method and means previously recited. However, Wu et al. does not disclose the apparatus, method and means comprising a second laser pump providing pump energy on a second wavelength to the first dispersion compensating fiber and the second dispersion compensating fiber.

Bolshtyanksy et al. discloses a second laser pump providing pump energy on a second wavelength to the first dispersion compensating fiber and the second dispersion compensating fiber (see Fig. 4, ref. 28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the second laser pump provide pump energy on a second wavelength since one would be motivated to expand the field of amplified wavelengths, thereby increasing the amplification range of the device.

Referring to claim 7, 15 and 23, Wu et al., Sun et al., Danziger and Bolshtyanksy et al. disclose the apparatus, method and means previously recited. However, the references do not explicitly disclose that the first laser pump traverses the first dispersion compensating fiber before entering the second dispersion fiber.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the first laser pump traverse the first dispersion compensating fiber before entering the second dispersion fiber since such a modification would allow a more systematic amplification and chromatic dispersion correction of the signal, by having the signal manipulated by predetermined subsequent stages.

Allowable Subject Matter

4. Claims 8, 16 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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5. The following is a statement of reasons for the indication of allowable subject matter:
The prior art of record does not teach or fairly suggest the apparatus wherein the pump energy provided by the first laser pump traverses the second dispersion compensating fiber before entering the first dispersion compensating fiber via a Bragg fiber grating that reflects optical energy at the first wavelength and transmits other optical energy.

Response to Arguments

6. Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.

7. Applicant's arguments filed 6 March 2003 have been fully considered but they are not persuasive.

8. In response to applicant's argument that the references failed to show that the first dispersion compensating fiber has a fixed length and the second dispersion compensating fiber has a variable length, Examiner has recognized the shortcomings presented by the newly added limitations, and therefore has added the Sun and Danziger reference to meet the limitations.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard H Kim whose telephone number is (703)305-4791. The examiner can normally be reached on 8:30-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703)305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Richard H Kim
Examiner
Art Unit 2882

RHK
May 5, 2003


RICHARD H. KIM
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